

# RESERVE COPY

## PATENT SPECIFICATION

429,379

Application Date : Feb. 7, 1934.      No. 4002/34.

Complete Specification Accepted : May 29, 1935.



### COMPLETE SPECIFICATION

#### Improvements in or relating to the Manufacture of Wallboard

We, ARTHUR WILLIAM PARFITT (Chartered Patent Agent) a British Subject, of Stafford House, Norfolk Street, Strand, London W.C.2, do hereby declare the nature of this invention (a communication from GYPSUM, LIME AND ALABASTINE, CANADA, LIMITED, a corporation of the Dominion of Canada, having its principal place of business at the Town of Paris, Province of Ontario, Dominion of Canada) and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the manufacture of wallboard of the type comprising a cementitious core surrounded by paper liners and is particularly directed to the construction of a gypsum board having bevelled or depressed margins on adjoining edges of the board to adapt the board for adequate joint formation during its erection in building construction.

The manufacture of gypsum wallboard is well known and it has heretofore been proposed to depress the longitudinal marginal edges of such boards.

In accordance with the invention, in the manufacture of wallboard consisting of a quick-setting cementitious core and enclosing paper liners a continuous sheet of such board is formed and carried by supporting rolls, while pressure is exerted on the upper surface of the sheet at successive points along its length and against one of the supporting rolls to form pairs of oppositely disposed bevels across the sheet and the sheet is thereafter severed at the junction of the bevels. The wallboard so formed has a marginal taper along at least two of its meeting edges when the longitudinal edges are tapered as hereinafter described.

The present invention will now be described with reference to the accompanying drawing, in which

Figure 1 is a longitudinal elevation of pertinent features of an apparatus for carrying out the invention;

Figure 2 is a transverse section, partially broken away, on line 2—2 of Figure 1;

Figure 3 is a transverse section, partially broken away, on line 3—3 of Figure 1;

Figure 4 is a side view of the cam shaft partially broken away;

Figure 5 is a detail view of the plate in relation to the cam; and

Figures 6 and 7 are end and longitudinal sections respectively of the board.

In the drawing, 1 and 2 indicate what are usually known as the squeeze rolls, which shape the core within the paper liners 3 and 4. At the upper edge of the ends of roll 2 is arranged a plate 5 which forms the depression or bevel indicated at 6 on the longitudinal margins of the board 6. The usual supporting belt 7 on which the board is carried is mounted on the driving rolls 8, one of which is shown in Figure 1, and the intermediate rolls 10.

To cause the belt to conform with the bevelled edges of the board in order that the bevelled edges may not be deformed before the core sets and the adhesive between the liner margins dries, an adjustable supporting structure for the marginal edges of the belt is provided. This structure comprises a series of relatively short rolls 11, each mounted in bearings 12 movably supported on cams 13 within the guide members 14 and 15 of the frame 16, which is provided for each roll. This structure is located at each side of the belt 7 at spaced points along the belt for a sufficient distance to permit the board to secure an adequate set or hardening to retain its shape, before the edges of the belt are permitted to disengage the bevelled edges of the board. The two pair of cams 13 in the supporting structure on immediately opposite sides of the belt are mounted on a shaft 17 which may be operated by a handle 18. A gear or sprocket wheel 19 is mounted upon one end of each of these shafts and a belt or chain 20 passes over these wheels to move all the cams in unison. As mounted in the frame, each roll is inclined as shown to conform with the bevel of the marginal edges of the board. As illustrated in Figure 3 the rolls 11 are positioned for making a relatively narrow board, say 32 inch instead of 48 inch. When the cams are operated the rolls 11 are lowered so that the inclined margin portions of the belt are much narrower and just sufficient to engage the bevels on the wider

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board, the remaining portion of the belt lying horizontally in engagement with the flat main body part of the board.

Towards the opposite end of the conveyor and in advance of the usual board-cutting means is arranged means for forming a depression across the moving board at successive points where the board is to be cut into desired lengths. Mounted across the conveyor above the roll 9 is a shaft 21 driven by a pulley 22 through a variable speed drive conventionally indicated at 23 with a speed regulator 23a, and carrying cams 24. The roll 9 is raised slightly, say one-sixteenth of an inch, above the plane of the supporting rolls and is somewhat larger in diameter in order to engage sufficient surface of the board when the latter is engaged by the plate 26 to form the desired depression. One of these cams located adjacent the edge of the board carries a second cam portion 25 for a purpose to be described later. A plate 26 is arranged between the cams 24 and board 6, being held in position by the spring 27. Near one of its ends the plate 26 has a slot or perforation 28 in which is mounted a spring-pressed plunger 29, the spring 30 normally retaining the plunger in raised position.

The operation of the process is as follows:

The slurry of hydrated calcined gypsum is fed to the lower paper liner in advance of the squeeze rolls which form the board, the margin of the lower liner 4 being turned over to enclose the edge of the board and it is caused to adhere to the upper liner, by the usual means, not shown in the drawing. The slight bevel 6' is formed in each edge of the board on its lower face by the plates 5. As the formed board travels forwardly the side portions of the belt under the bevelled edges of the board are held in a slightly raised, outwardly inclined position by the adjustable rolls 11 to support the bevelled edges and prevent them from sagging or becoming deformed until the board has hardened sufficiently to retain its form without such support.

It will be observed that the rolls 11 are adjustable for various widths of board, so that in each case they deflect upwardly the portions of the supporting belt which are beneath the bevelled edges of the board. When the cams 13 are operated to lower the rolls 11 from the position shown in Figure 3 in the manufacture of a wider board, the rolls engage the belt at points near its edge.

After travelling beyond the zone in which the series of edge-supporting rolls 11 is used, the board is given further

opportunity for the core to set, as described, before it reaches the point at which it is to be severed into the desired length. Before reaching this point, the board travels under the plate 26 to form a depression across the lower face of the board. The shaft 21 reciprocating at a predetermined rate of speed causes the cams 24 to engage the plate 26 forcing the board against the curved surface of the roll 9, thus forming a depression in the under face of the board. This depression is deepest at its central point and tapers away in both directions. A mark or slight indentation is placed on the upper face of the board at the central point of the depression by means of the plunger actuated by the cam portion 25. This mark or indentation on the upper surface of the board indicates the point at which the board is to be severed and the usual cutting means, not shown, is arranged to sever the board at this point. The board being moving forward when it is engaged by the plate 26, the spring 27 is provided to return the plate to its normal position when it is released by the cams 24.

It will thus be observed that the board so formed has a bevel on its four marginal edges and on the front surface of the board which is the surface exposed when the board is erected in building construction. If desired, the bevel or tapered margin may be formed on only one side and one end of the board. Such a construction may be used where it is necessary to form joints on only one side and one end of the board, as in the lower corner of a room where two adjacent edges of board are not exposed.

It will be apparent that the usual scoring devices for the lower liner will be arranged closer together in order to accommodate the decreased thickness of core at the edge of the board. The variable speed drive 23 will be regulated to determine the rate of reciprocation of the cam shaft in accordance with the lengths to which the board is to be cut.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:—

1. The method of manufacturing wall-board consisting of a quick-setting cementitious core and enclosing paper liners, wherein a continuous sheet of such board is formed and carried by supporting rolls, characterized in that pressure is exerted on the upper surface of the sheet at successive points along its length and against one of the supporting rolls to form pairs of oppositely disposed

bevels across the sheet and the sheet is thereafter severed at the junction of the bevels.

2. The method defined in Claim 1, wherein a mark is placed upon the upper surface of the sheet adjacent one edge thereof and opposite the centre line of each depression formed in the sheet.

3. The method defined in Claim 1, wherein a plate is automatically forced against the upper surface of the sheet at regulated intervals during the travel of the sheet to force the same against a supporting roll and form a curved depression in the lower face of the sheet, a mark is placed on the upper surface of the sheet to identify the centre of said depression and the sheet is thereafter severed at each such mark.

4. The method defined in Claim 1,

wherein a bevel is formed on at least one longitudinal margin of the board and supported until the board has substantially hardened.

5. A wallboard whenever produced by the method defined in Claim 4 comprising a core of quick-setting cementitious material enclosed in paper liners characterized in having a marginal taper along at least two meeting edges of the board.

6. A wallboard as defined in Claim 5, wherein there is a bevelled edge on all four margins of the board.

Dated this 7th day of February, 1934.

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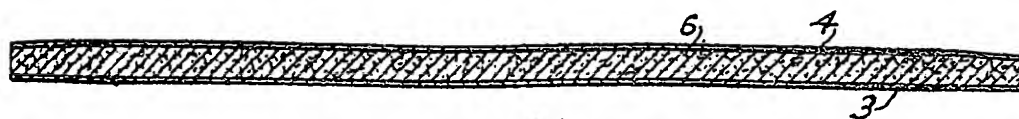


Fig. 7

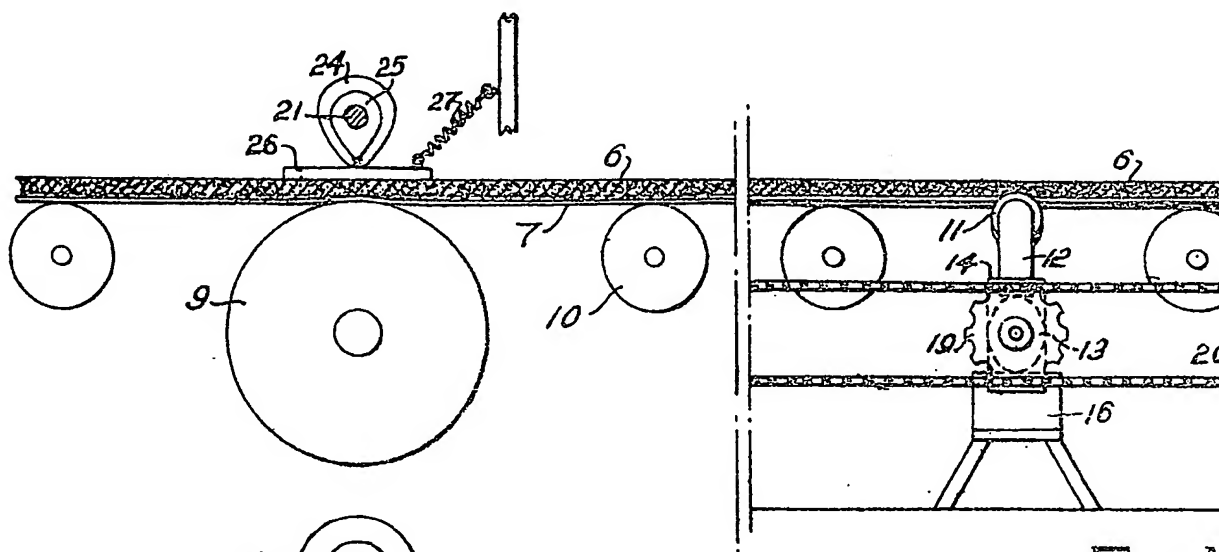


Fig. 1

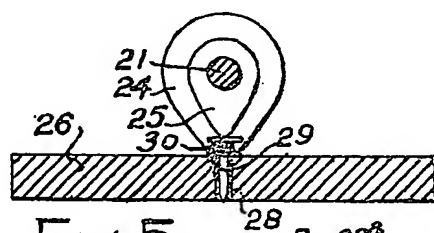


Fig. 5

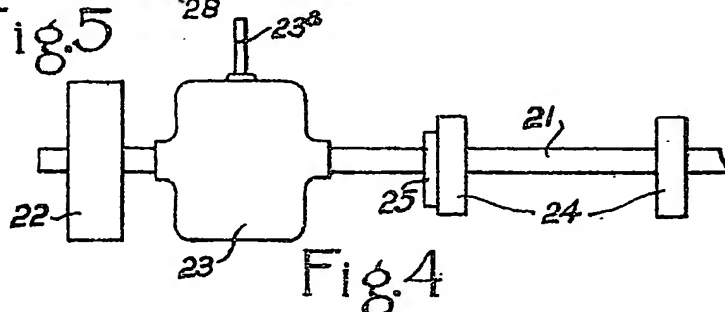
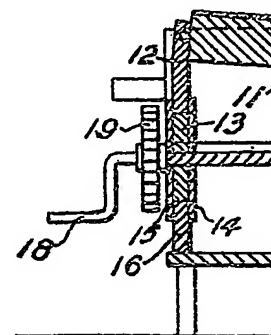


Fig. 4



[This Drawing is a full-size reproduction of the Original.]

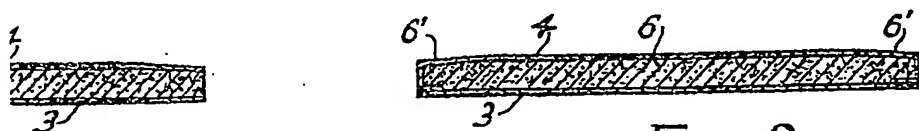


Fig. 6

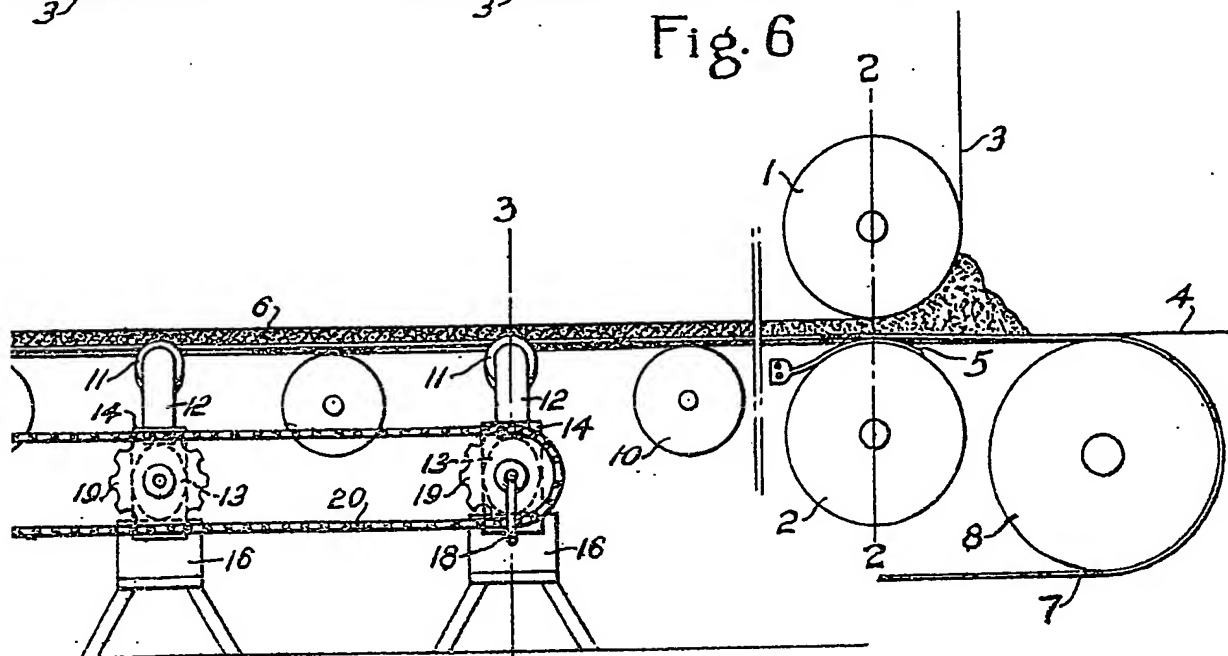


Fig. 1

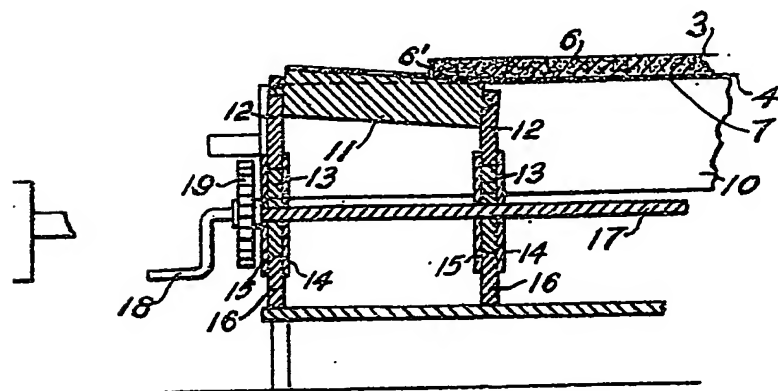


Fig. 3

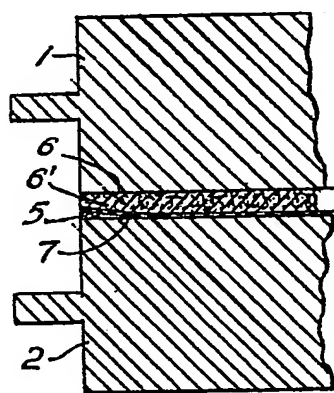


Fig. 2

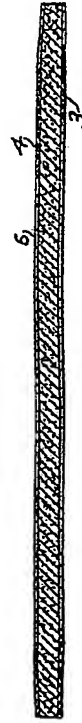


Fig. 7

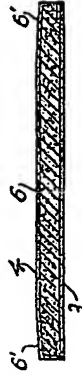


Fig. 6

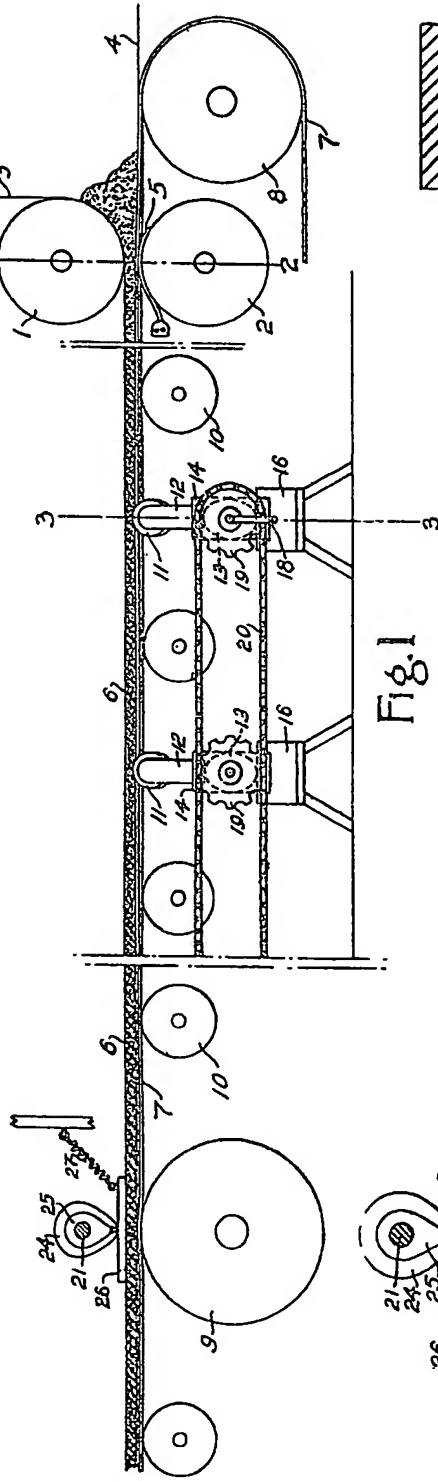


Fig. 1

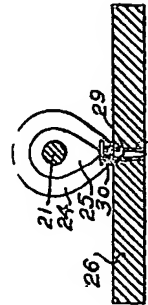


Fig. 5

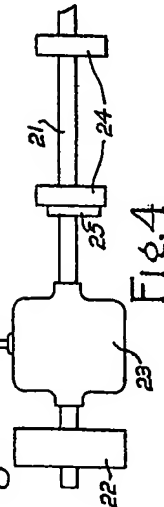


Fig. 4

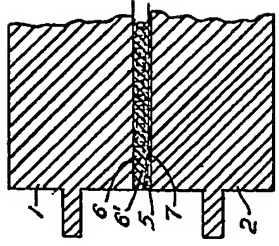


Fig. 2

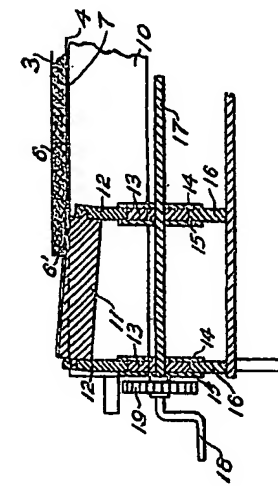


Fig. 3

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